

Particulate Matter Monitoring in California

Michael Poore
Monitoring and Laboratory Division

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PM10-Dichotomous Program

Sample Collection

- 10 microns size particle inlet
- Particle sizes further separated into "fine" (0-2.5 micron) and "coarse" (2.5-10 micron)
- The two fractions are collected on separate pre-weighed 37mm Teflon filters
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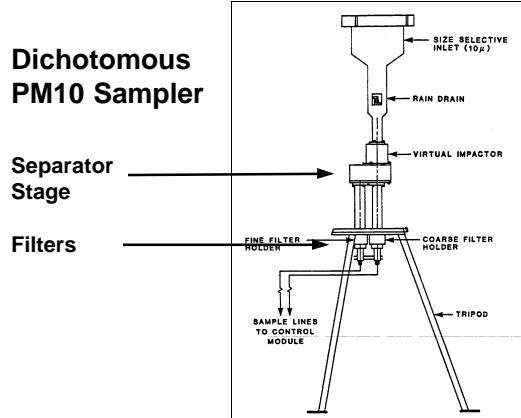
PM10-Dichotomous Program

Sample Analyses

- Samples weighed pre and post sampling to determine mass concentrations
- Samples analyzed by X-ray fluorescence (XRF) spectroscopy for elemental composition

CA Dichotomous Stations

- | | |
|---------------|-----------------|
| • Azusa | • Portola |
| • Long Beach | • Sacramento |
| • Bakersfield | • San Jose |
| • Corcoran | • Coso Junction |
| • Fresno | • Keeler |
| • Madera | • Lone Pine |
| • Modesto | • Calexico |
| • Stockton | |
| • Taft | |
| • Visalia | |



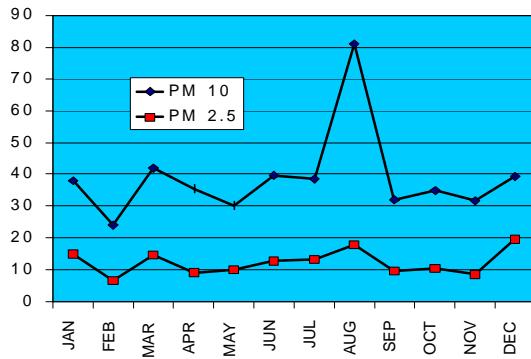
**California has a rich data base
for PM2.5**

What does it tell us?

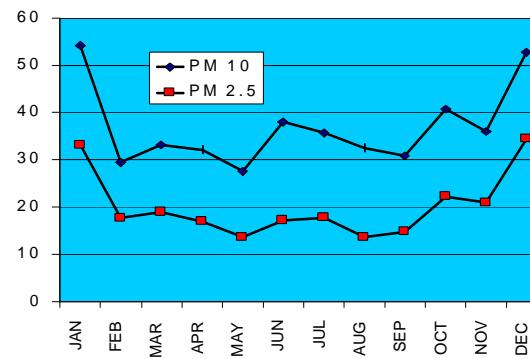
PM 2.5 Mass Concentration

Seasonal Variation

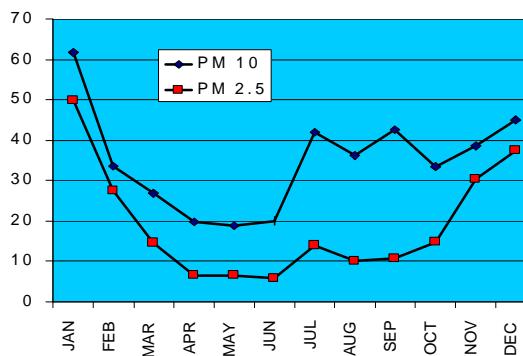
E l C e n t r o



L o n g B e a c h



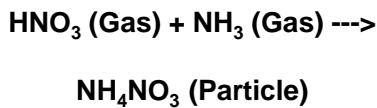
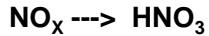
F r e s n o



Constituents of PM2.5

- Ammonium
- Nitrate
- Carbon species
- Ammonium
- Sulfate
- Crustal elements

Ammonium Nitrate Formation



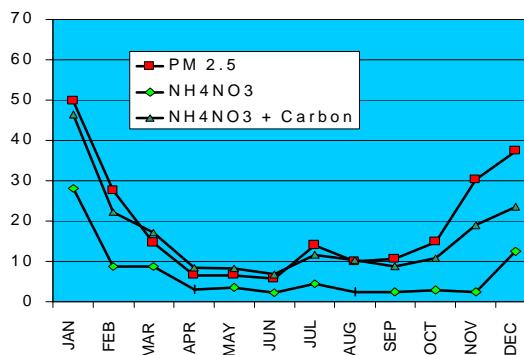
Total Carbon

Total Carbon =

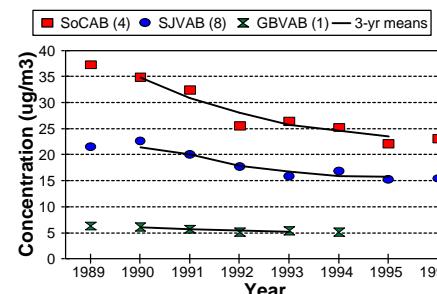
$$\text{Organic Carbon} + \text{Elemental Carbon}$$

- **Organic Carbon** : Combustion with most coming from secondary processes
- **Elemental Carbon** : Soot generated in combustion

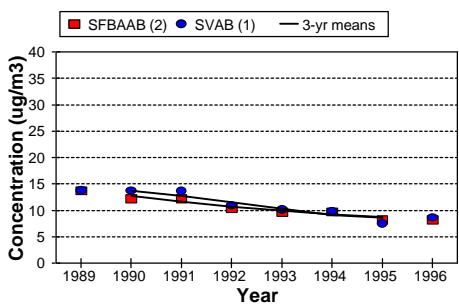
Fresno



PM2.5 Trends by Air Basin Maximum Annual Geometric Mean



PM2.5 Trends by Air Basin Maximum Annual Geometric Mean



Conclusion

- Routine monitoring provides good but limited information
- Complex regional variation